

Lecture Abstract:

Frontiers of Paleo-Climite Research

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The frontiers of any particular field of research describe the furthest progress achieved so far and the mid-term aspirations. The progress can be monitored by following the most recent publications or by referring to assessment reports such as those from the IPCC. Seismometers of the trends where science might go include vision statements of large science organisations, science plans of smaller organizations and research programs of funding organizations.

Based on such resources and my own subjective perception I will discuss aspects of paleoclimate science. I will outline the state-of-the-art (including the limits-of-the-art) and highlight ongoing or emerging trends in the respective fields.

The aspects related to paleoclimate science that I intend to address include:

- Paleoclimate proxy records, with a substantiated call for quality over quantity with respect to resolution, calibration, dating, process understanding, and uncertainty expression.
- Paleoclimate modelling, where meaningful model-data comparison is in the process of making a quantum leap through transient paleoclimate simulations, data assimilation techniques, and forward modelling of paleoclimate proxies.
- The role of paleoclimatic data, which can advance paleoscience crucially if the data are shared, compiled, turned into products, and archived.
- Research on the impact of climate changes in the past, acknowledging the important value for the global change debate of climate-related disciplines such as paleoecology, paleohydrology, and even archaeology.
- The role of human and societal interaction with their environment and with climate, which becomes increasingly relevant also on timescales of paleoscientific studies and is attracting interest of scientists and public alike.
- Paleoclimate science in the context of global-scale trends in Global Environmental Change research, where keywords such as *sustainability*, *solution-oriented*, and *actionable* lay out ideas for future research priorities.
- An outsider's view on the role of speleothems in the broader context of paleoclimate research.

Rather than any heavy reading I recommend some browsing and light reading:

- 1) Website of the “*Future Earth*” programme:
<http://www.icsu.org/future-earth>

¹ PAGES International Project Office, Bern, Switzerland

2) Two most relevant issues of *PAGES news*:

Bondre, N., Kiefer, T. and von Gunten, L. (Eds), Paired Perspectives on Global Change 20(1), 2012. <http://www.pages-igbp.org/products/pages-news/93-20-1-paired-perspectiveson-global-change>

Fleitmann, D., Spötl, C., Newman, L., Kiefer, T. (Eds) Advances in Speleothem Research 16(3), 2008. <http://www.pages-igbp.org/products/pages-news/240-16-3-advances-inspeleothem-research>

3) Potentially also of the PAGES Science Plan:

<http://www.pages-igbp.org/products/pages-outreach/205-pages-science-plan-andimplementation-strategy>